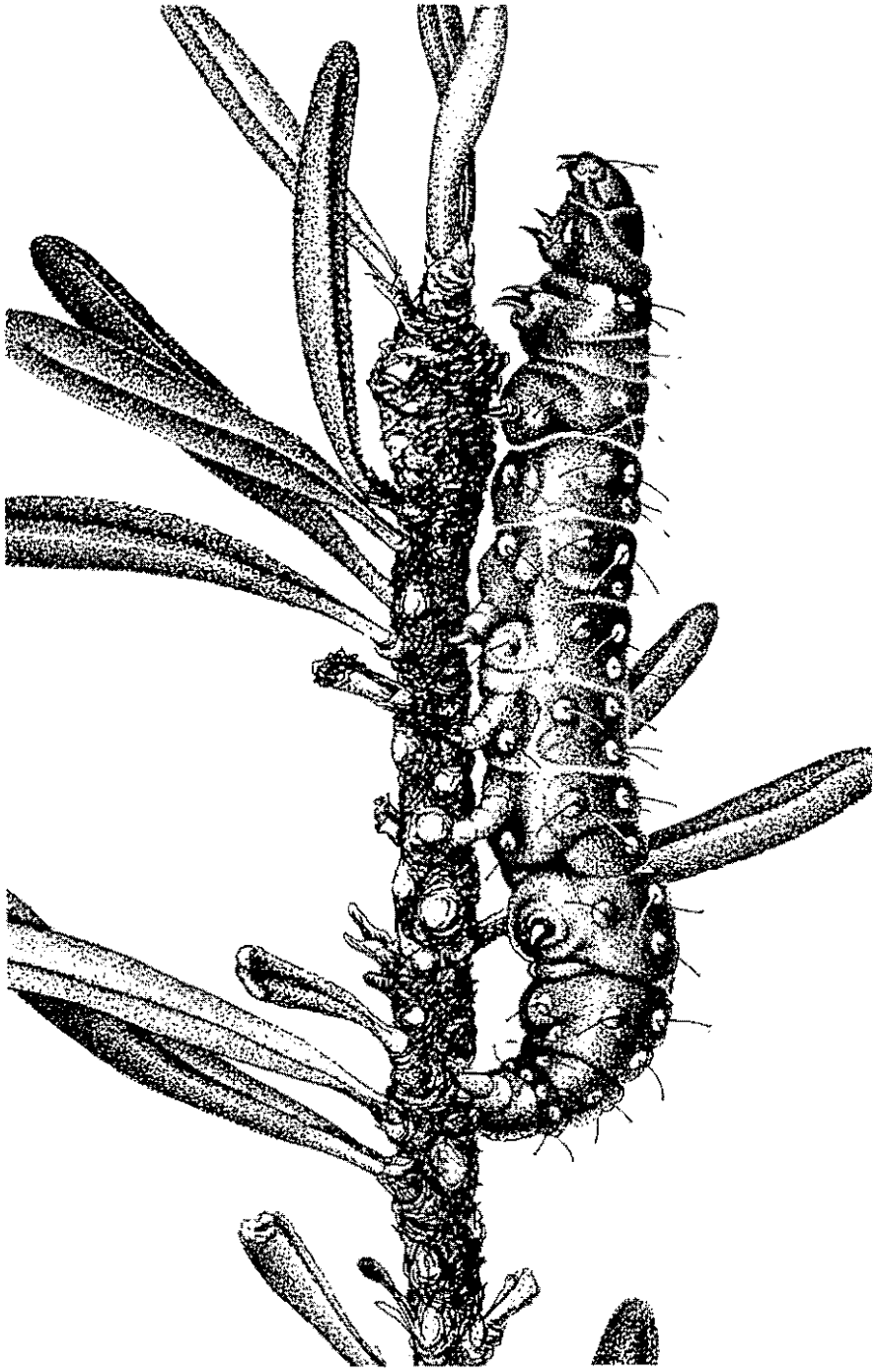

MICHIGAN FOREST PEST CONDITIONS 1976

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INTRODUCTION

This is a summary of the forest pest conditions for the State of Michigan during 1976. This report has been divided into two parts and will deal with the Lower Peninsula and the Upper Peninsula separately.

Information for this summary was obtained primarily from three sources: 1) personal observations and field surveys; 2) monthly pest reports submitted by DNR Area Foresters; 3) contacts with pest specialists from other agencies.

LOWER PENINSULA

INSECTS

ARBORVITAE LEAF MINERS (*Argyresthia sp.*)

Browning and defoliation of cedar continued throughout most of the northern Lower Peninsula. In general, the area of defoliation remained about the same as in 1975. However, the severity of defoliation appeared to decrease somewhat in the western counties, while it increased in some of the north central areas, such as Montmorency and Roscommon counties.

A survey was conducted during 1976 to measure defoliation and mortality. This survey revealed three things: 1) the average mortality for the 22 stands surveyed was only 1.2%; 2) defoliation was more severe on the edge of a stand than in the interior; 3) there are at least three different species of leaf miners involved in the outbreak.

At this point in the outbreak, it does not appear that the arborvitae leaf miner complex will be a major tree killer. Further decreases in the population are expected next year.

PINE ROOT COLLAR WEEVIL (*Hylobius radicis*)

This pest was reported to be increasing on the Fife Lake, Pere Marquette, and Chippewa River State Forests. An increasing number of state and private red pine plantations are sustaining mortality.

In these high hazard areas, red pine should not be planted within one-half mile of an infested stand. In addition, early basal pruning and duff removal are recommended silvicultural controls. Despite the fact that these control methods work, there appears to be a reluctance on the part of land managers to use them.

SARATOGA SPITTLEBUG (Aphrophora saratogensis)

Damaging populations were reported on over 210 acres of red pine plantations on the Pere Marquette, Chippewa River, and Black Lake State Forests. In some cases the plantations were too badly damaged to justify control. Fortunately, many of the plantations were old enough so that they will outgrow the problem before serious damage occurs.

A herbicide was used to control the alternate host plants on 30 acres of red pine on the Black Lake State Forest. Success of the control project was variable.

OAK LEAF ROLLER (Archips semiferanus)

Reports of oak defoliation caused by this insect increased in 1976. Moderate to heavy defoliation occurred in Oscoda, Alcona, Iosco, Roscommon, and Montmorency counties. In addition, about 6,000 acres sustained light defoliation in Presque Isle and Cheboygan counties.

A group of researchers from Pennsylvania State University came to Michigan to collect insects in Iosco County during June. They are studying the pheromone system of this pest.

SADDLED PROMINENT (Heterocampa guttivitta)

Light to moderate defoliation of hardwoods occurred over scattered areas im Emmet, Cheboygan and Kalkaska counties. Approximately 2,000 acres of heavy defoliation was reported on South Manitou Island.

Tree mortality can occur in areas suffering two consecutive years of defoliation. But past outbreaks of this pest have been short-lived.

PINE ROOT TIP WEEVIL (Hylobious rhizophagus)

Infested pole-sized Scotch pine plantations continue to be reported in the northern Lower Peninsula.

A survey of 12 infested plantations in 10 counties revealed that over 75% of the trees had some degree of "flagging". Mortality ranged from 1% to 37%. The average mortality for all plantations was over 15%.

The potential impact of this insect would seem to be an additional argument against growing Scotch pine for pulp and timber production in the northern Lower Peninsula.

JACK PINE BUDWORM (Choristoneura pinus)

Populations continued to decline from the outbreak levels of 1974. The only defoliation reported was 5,000 acres of light defoliation in Presque Isle County.

The permanent plots established in 1975 were remeasured in 1976 as part of a continued effort to gather impact data on this important pest of jack pine.

SPRUCE BUDWORM (Choristoneura fumiferana)

The localized outbreaks in Alpena, Otsego and Cheboygan counties began to taper off during 1976. This may be due to the fact that most of the balsam fir in these areas has been killed.

Local markets permitted much of the overmature balsam fir to be harvested on the Alpena State Forest.

FOREST TENT CATERPILLAR (Malacosoma disstria)

Numbers of this insect dropped off from previous years. Light to moderate defoliation was only reported in Kalkaska and Montmorency counties.

BLACK WALNUT SHOOT MOTHS (Acrobasis demotela and A. juglandis)

The cooperative research project on these two pests continued for the second year. Major accomplishments during 1976 included filling in the life history of A. demotela and additional testing of systemic insecticides.

GYPSY MOTH (Porthetria dispar)

The Michigan Department of Agriculture, Plant Industry Division and the U.S.D.A., Animal and Plant Health Inspection Service continued their cooperative gypsy moth eradication program during 1976.

The insecticide Sevin-4-oil was applied to 16,330 acres in Isabella, Midland and Montcalm counties. The trapping program consisted of setting out 13,808 traps. At the present time, 432 moths have been caught this year. The majority of these moths were caught in Gratiot, Isabella, Midland, and Montcalm counties.

Next year's program will be based on an evaluation of this year's detection survey.

OTHER INSECTS

Moist conditions this spring contributed to outbreak populations of APHIDS in many parts of southern Michigan. With the onset of a dry summer, complaints about aphids dropped off. But the dry weather brought on a deluge of complaints about MITE problems on nearly all species of trees and shrubs.

The MAPLE LEAF CUTTER (Paraclemensia acerifoliella) continued to heavily defoliate woodlots in Benzie and Manistee counties.

Outbreak populations of the PITCH MIDGE (Cecidomyia sp.) were responsible for causing severe flagging of jack pine over extensive areas in Oscoda and Crawford counties. Population of this pest are known to fluctuate markedly.

ANOMOLA BEETLE (Pachystethus oblivia) numbers increased in Kalkaska and Presque Isle counties. Light to moderate defoliation of jack and red pine was reported.

The EASTERN TENT CATERPILLAR (Malacosoma americanum) was exceptionally numerous in parts of the Lower Peninsula as was the FALL WEBWORM (Hyphantria cunea). ELM LEAF BEETLE (Pyrrhalta luteola) populations decreased some from last year and so did the number of complaints and inquiries.

DISEASES

PINE NEEDLE RUST (Coleosporium asterum)

Wet weather during August last year was responsible for numerous reports of this disease in young red pine plantations this spring. This disease can cause serious damage to young trees, especially those that are suppressed by competing vegetation.

Control of weeds with chemicals or by mowing is recommended because it improves air circulation and allows trees to dry quickly. This helps reduce infection.

The incidence of the disease should be down next year because of the dry August we had this year.

OAK WILT (Ceratocystis fagacearum)

In recent years, new infections have been located in the northern Lower Peninsula. For this reason, Lake, Clare, Grand Traverse and Missaukee counties were included in the aerial survey conducted by the Michigan Department of Agriculture during 1976.

No new infection centers were detected in these counties. But there were newly infected trees found at some of the known infection sites. In addition, a new infection was found in Roscommon County. This was the first find in Roscommon County.

DUTCH ELM DISEASE (Ceratocystis ulmi)

The registration of a new chemical called Lignasan BLP made news this year. Lignasan BLP is a more solubilized form of benomyl that is registered for tree injection by licensed arborists only.

This chemical may have a place in control programs where sanitation, root graft control and bark beetle control are already being used.

ANTHRACNOSE (Gnomonia sp.)

Anthracnose was very common again this year on sycamore, oak, and maple in southern Michigan.

BUTTERNUT DECLINE

This disease, which is causing serious mortality of butternut in Wisconsin, was found in Jackson County this year.

The decline and death of a tree is caused by hundreds of branch and trunk cankers. The fungus causing the cankers has been isolated, but has not yet been identified.

Intensive research is being conducted to come up with a control for this disease.

MISCELLANEOUS

MYCORRHIZAE

During 1976 Forestry Division cooperated with the U. S. Forest Service, State and Private Forestry in a survey to evaluate mycorrhizal development in red pine at Wyman and Southern Michigan State Nurseries.

The percentage of mycorrhizal roots on red pine was found to be less than normal.

Methods are currently being developed to increase mycorrhizal development. By using these cultural methods when they become available, we should be able to increase the percentage of mycorrhizal roots on our nursery stock. The end result will be an increase in outplanting survival and a shortening of production time.

Another survey of endomyccorhizae development on black walnut in the Southern Michigan State Nursery indicated a very good percentage of endomyccorhizal roots.

ICE AND FROST DAMAGE

A severe ice storm during March caused a tremendous amount of tree damage in a 29 county area in southern Michigan.

An exceptionally warm April was followed by a killing frost. Many species of trees and shrubs sustained considerable damage.

MAPLE DECLINE

Reports of this problem continued to come in during 1976. All of the reports dealt with trees in an urban area or along rural roads. There was a noticeable increase in maple decline reports from northern urban areas.

UPPER PENINSULA

INSECTS

SPRUCE BUDWORM (Choristoneura fumiferana)

Forestry Division cooperated with the U. S. Forest Service, State and Private Forestry, in conducting an aerial detection survey of spruce budworm damage in the Upper Peninsula.

Survey results revealed that the gross acreage of defoliation was 815,520 acres of state, federal and private land. Defoliation was separated into three different categories as follows:

Heavy defoliation with mortality and top-kill	- 375,680 acres
Heavy defoliation with no mortality or top-kill	- 343,840 acres
Light to moderate defoliation	- 96,000 acres
Total	= 815,520 acres

In general, populations are continuing to decline in areas where the outbreak first began. At the same time, the outbreak continues to move into new areas. Nearly all of the spruce-fir type in the Upper Peninsula is involved in some stage of the outbreak.

A report containing survey results and recommendations is being prepared and will be distributed to the land managers.

FOREST TENT CATERPILLAR (Malacosoma disstria)

The outbreak in the western Upper Peninsula expanded during 1976 as did the smaller outbreak on the east end.

Aerial surveys detected 115,000 acres of aspen defoliation in Ontonagon County. In addition, about 18,000 acres of northern hardwoods were defoliated in Mackinac and Chippewa counties, including Drummond Island. Scattered light defoliation was reported in many areas between these two major outbreaks.

No serious mortality should result, although some growth loss will occur. The outbreak is expected to continue next year.

MAPLE DEFOLIATORS

Several insects were responsible for serious defoliation of hard maple in many areas of the Upper Peninsula during June. Many samples

were received and the following insects were identified: a leaf roller (Sparganothis acerivorana), linden looper (Erannis tiliaria), basswood leafroller (Cenopis pettitana), and a looper (Physiostegania pustularia).

These pests were responsible for a large area of defoliation near Alberta in Baraga County. They also caused about 8,000 acres of defoliation in Alger, Luce, and Mackinac counties. In some areas, these insects were found along with the forest tent caterpillar.

Sugar maple will not tolerate defoliation as well as many other trees, so this problem will be watched closely next year.

SADDLED PROMINENT (Heterocampa guttivitta)

Light populations of this insect could be found in nearly every northern hardwood stand examined in the Upper Peninsula this summer. In addition, moderate to heavy defoliation was reported on over 13,200 acres of northern hardwoods in Alger, Schoolcraft, Mackinac and Luce counties. Some of these areas had been previously defoliated earlier in the year by various insects already mentioned. The drought that occurred in many parts of the Upper Peninsula could compound the impact of this defoliation.

The potential for an outbreak next year does exist. But hopefully, this pest will behave as it has in the past and populations will decline quickly.

PINE ENGRAVER (Ips pini)

The dry summer last year was responsible for scattered bark beetle outbreaks in parts of the Upper Peninsula last year. Pine stands in Iron and Dickinson counties were the hardest hit. Stands where cutting had occurred sustained the most damage.

Despite the fact that the Upper Peninsula suffered through another dry summer during 1976, the bark beetle outbreak appears to have declined this year. There were no reports of expanding pockets of mortality from areas that were hit last year.

JACK PINE SAWFLY (Neodiprion pratti banksianae)

This pest continued to be a problem in Schoolcraft this year. About 2,000 acres of jack pine suffered light to moderate defoliation.

BIRCH LEAF MINER (Fenusa pusilla)

Heavy defoliation occurred again this year throughout Iron County. Moderate to light defoliation was reported in Dickinson and Marquette counties.

OTHER INSECTS

The LARCH SAWFLY (Pristiphora erichsonii) was observed causing moderate to heavy defoliation in many areas of the eastern Upper Peninsula.

RED-HEADED PINE SAWFLY (Neodiprion lecontei) populations were high enough in Chippewa County so that some private landowners had to use chemical control in their pine plantations.

Several white spruce plantations and many trees along the highways were heavily defoliated by the YELLOW-HEADED SPRUCE SAWFLY (Pikonema alaskensis) in Mackinac and Chippewa counties.

Several red pine plantations that were badly damaged by the SARATOGA SPITTLEBUG (Aphrophora saratogensis) were detected in Iron County. Damage was too severe to justify control measures.

DISEASES

SCLERODERRIS CANKER (Scleroderris lagerbergii)

An evaluation survey conducted by Forestry Division and the U. S. Forest Service determined that the major impact of scleroderris was in the Danaher Plains area in Schoolcraft and Luce counties. This disease has essentially prohibited reforestation in about a 25,000 acre area.

Further research may be conducted in this area. It appears now that resistant varieties of Scotch pine may offer the most hope of putting this area into production. Test plantings will be made in the future.

NECTRIA CANKER (Nectria galligena)

Forestry Division and the U. S. Forest Service, State and Private Forestry, conducted a survey of Nectria canker on yellow birch in the Upper Peninsula during 1976.

Specific hazard zones were identified where the disease is having a significant impact on production of yellow birch. We found that in most cases the severity of infection increases as you move closer to the Great Lakes.

The discovery of this "lake effect" can have a significant impact on the management of northern hardwoods in the Upper Peninsula. In the

high hazard areas the land manager can discriminate against yellow birch and manage for a less susceptible species. At the same time, management for yellow birch can be concentrated in the low hazard areas.

A survey report with management recommendations is being prepared and will be distributed to the land managers.

DUTCH ELM DISEASE (Ceratocystis ulmi)

This disease continues to increase in the western Upper Peninsula. The heaviest losses have been along water courses.

DWARF MISTLETOE (Arceuthobium pusillum)

During 1976, Forestry Division and the U. S. Forest Service cooperated on a survey of dwarf mistletoe on black spruce. Specific infection areas were identified throughout the Upper Peninsula. Significant mortality was found in the center of these infection areas.

A survey report will be distributed.

ARMILLARIA ROOT ROT (Armillaria mellea)

The past two dry summers have contributed to an increase in this disease in Menominee County. Over 2,000 acres of red and Scotch pine plantations were affected to some degree. In some local areas, mortality was reported to be as high as 25%.

AIR POLLUTION INJURY

SO_2 injury was responsible for causing the chlorosis and death of white pine in the Marquette area. Approximately 10% of the trees in the area were sensitive to present levels of SO_2.